

REMARKS

This is intended as a full and complete response to the Office Action dated June 18, 2003, having a shortened statutory period for response set to expire on September 18, 2003. Please reconsider the claims pending in the application for reasons discussed below. Claims 1-32 remain pending in the application and are shown above. Claim 17 have been amended to correct minor typographical errors. Since no narrowing amendments are made, Applicants assert it is entitled to the full scope of equivalents. Applicants present new claims 33-36 to be considered by the Examiner.

35 U.S.C. §102 Rejections

Claims 1-10, 26-29 are not anticipated by *Tsai et al.* under 35 U.S.C. §102(e)

Claims 1-10, 26-29 stand rejected under 35 U.S.C. 102(e) as being anticipated by *Tsai et al.* (Patent No. 6,524,167). The Examiner states that *Tsai et al.* teaches a method of removing a dielectric disposed on a substrate 300 having a shallow trench isolation (Figure 2) with a fixed abrasive chemical mechanical polishing pad and a polishing composition. Applicants respectfully traverse the rejection.

Tsai et al. discloses a method and composition for selective removal of a conductive material residue and a portion of a barrier layer from a substrate surface. (See, Abstract and Summary of the Invention.) The composition of *Tsai et al.* is to polish and planarize metal layer residues, such as bulk conductive layer residues (copper, aluminum, etc.), and barrier layer materials for conductive metals, such as tantalum, titanium, titanium nitride, titanium silicon nitride, etc. (See, column 5, lines 15-24 and column 6, lines 47-57.) As disclosed in Figure 2 of *Tsai et al.*, the substrate 300 includes a dielectric layer 310, a barrier layer 312, and a bulk conductive metal layer 314. Applicants respectfully point out that nowhere does *Tsai et al.* disclose polishing a shallow trench isolation structure, contrary to the Examiner's statement.

Thus, *Tsai et al.* does not teach, show, or suggest the method as recited in claims 1-10, for a substrate which includes a shallow trench structure having a first dielectric material and a second dielectric material. In addition, the composition of *Tsai et al.* is for removing metal material and metal layer residues and includes a chelating

agent, an oxidizer, a corrosion inhibitor, abrasive particles, and water, where the chelating agent chemically react with metal ions to minimize re-deposition of metal ions. (See, column 5, lines 25-37.) Thus, *Tsai et al.* does not teach, show, or suggest a composition for removing dielectric materials that excludes abrasives and includes at least one organic compound selected from a group of amino acids, at least one pH adjusting agent, and water, as recited in claims 26-29. Claims 1-10, 26-29 are in condition for allowance and withdrawal of the rejection is respectfully requested.

35 U.S.C. §103 Rejections

Claims 11-25 and 30-32 are not obvious over *Tsai et al.* in view of *Kaisaki et al.* under 35 U.S.C. §103(a)

Claims 11-25 and 30-32 stand rejected under 35 U.S.C. 103(a) as being obvious over *Tsai et al.* in view of *Kaisaki et al.* (WO 98/49723). The Examiner states that *Tsai et al.* teaches all the limitations of the claims except for the removal rate of the second dielectric material being less than the removal rate of the first dielectric material and *Kaisaki et al.* teaches the removal rate of the second dielectric material being less than the removal rate of the first dielectric material at page 13, lines 13-18. The Examiner also states that it would have been obvious to combine the teachings of *Tsai et al.* and *Kaisaki et al.* in order to enhance polishing capabilities. Applicants respectfully traverse the rejection.

Tsai et al. is discussed above. In addition, *Tsai et al.* does not teach, show, or suggest a polish system having a controller configured to deliver a polishing composition, as recited in claim 30-32.

Contrary to the Examiner's statement in the second paragraph of Section 4, *Kaisaki et al.* does not discuss different removal rates between first and second dielectric materials. Instead, *Kaisaki et al.* discloses a method of polishing a wafer having a second conductive or barrier material (see, page 12, lines 12-14) deployed over a patterned layer of a first material using a fixed abrasive article until an exposed surface of the wafer is planar to expose the first and the second materials. (See, Figures 1-2, Summary, from page 3, lines 29-30 to page 4, lines 1-2, and throughout the patent application.) Also, as the Examiner points out, *Kaisaki et al.* discloses "the

abrasive article(s) of the present invention are designed to produce a planar surface on wafers....." at page 13, lines 15-18. Thus, *Kaisaki et al.* discloses the advantage of selectivity to topography of two materials deployed on a wafer and the selectivity to topography is offered by abrasive composites fixed to an abrasive article (fixed abrasive technology) until the exposed surface of the wafer is planar ("stop-on-planar" capability). (See, page 3, lines 25-30 to page 4, lines 1-2.) *Kaisaki et al.* does not teach, show, or suggest polishing a shallow trench isolation structure, nor selectivity for different dielectric materials, such as an oxide material and a nitride material. Further, *Kaisaki et al.* does not teach, show, or suggest a polishing composition having at least one organic compound as recited in claims 11-25 and 30-32.

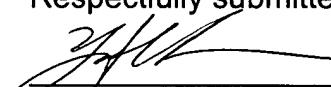
Therefore, *Kaisaki et al.* does not teach, show, or suggest a method of selectively removing a dielectric material having a first dielectric material and a second dielectric material including dispensing a polishing composition having at least one organic compound, as recited in claims 11-25. In addition, *Kaisaki et al.* does not teach, show, or suggest a removal rate ratio of the oxide material to the nitride material of about 10:1 or greater, as recited in claims 17-25. Further, *Kaisaki et al.* does not teach, show, or suggest a polish system having a controller configured to deliver a polishing composition, as recited in claim 30-32.

In the last paragraph on page 3 of the office action, the Examiner disposes of the limitations reciting the removal ratio as being merely the optimum or workable ranges of general conditions disclosed in the prior art. This rule is not relevant to the present case because the prior art does not disclose the general conditions of using an organic compound in a polishing composition to effect differential removal rates. *Tsai et al.* and *Kaisaki et al.*, alone or in combination, do not teach, show, or suggest a method of selectively removing a dielectric material having a first dielectric material and a second dielectric material including dispensing a polishing composition having at least one organic compound, a removal rate ratio of the oxide material to the nitride material of about 10:1 or greater, nor a polish system having a controller configured to deliver a polishing composition, as recited in claims 11-25 and 30-32. Claims 11-25 and 30-32 are in condition for allowance and withdrawal of the rejection is respectfully requested.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed. The secondary references made of record are noted. However, it is believed that the secondary references are no more pertinent to the Applicants' disclosure than the primary references cited in the office action. Therefore, Applicants believe that a detailed discussion of the secondary references is not necessary for a full and complete response to this office action.

Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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